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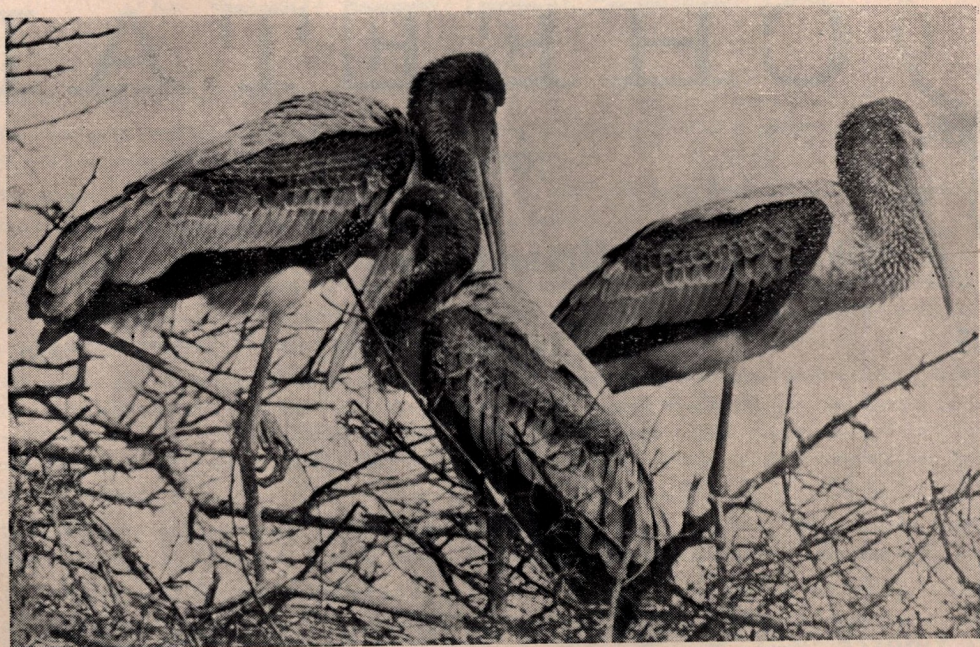
September, 1983

No. 1

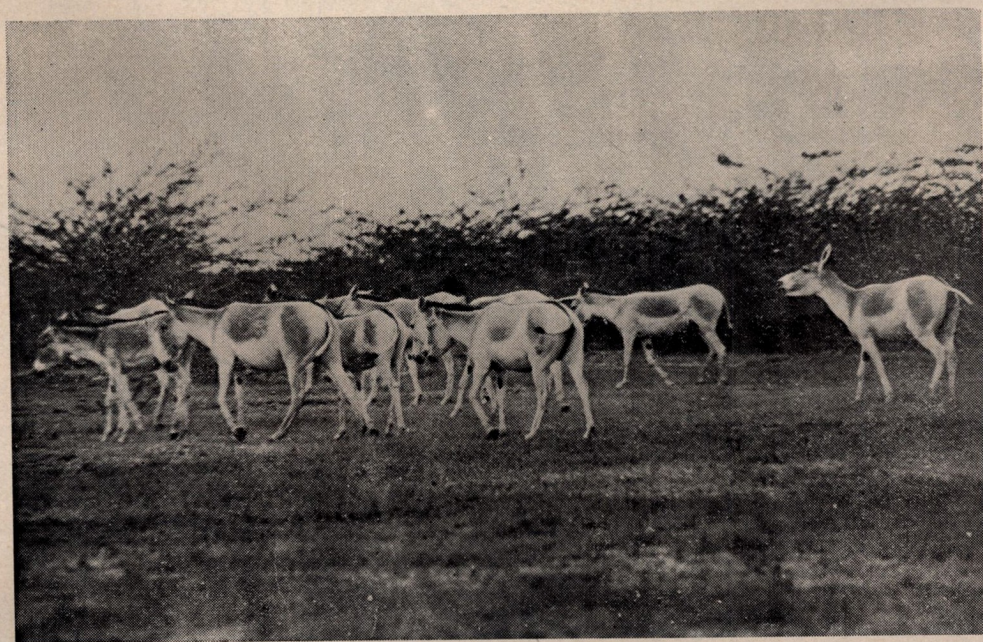
KANHA TIGRESS—Kanha Tiger Reserve

Photo—S.P. Shahi





Three month old chicks of painted stork—Bharatpur.



Wild ass in the little Rann of Cutch near *P. juliflora* plantation.

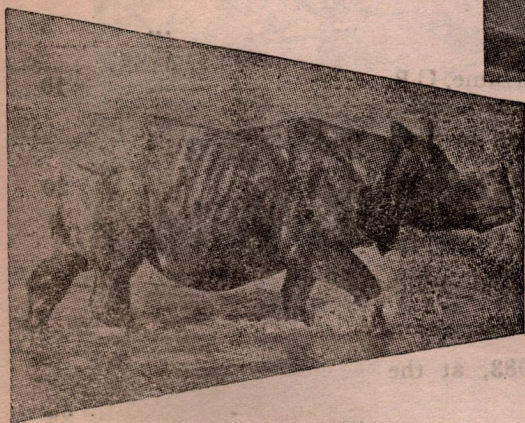
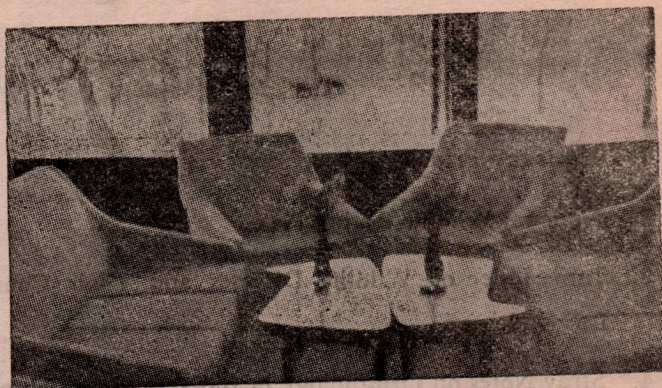
Photos by S.P. Shahi.

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MESSAGE

India's philosophy has always been one of respect for all living creatures, so all life has flourished in our country. We have had great numbers and vast variety in our forests and wild life. This lends colour and distinction to the national scene.

Unhappily, pressures of modernisation linked with an unprecedented growth in population have diluted many of those values which we had held sacred. The rapid depletion of our forests and the extinction of some species of animals and plants has been an unfortunate result. As we strive towards reviving the former greatness of our country, it becomes essential to reawaken our regard for living things and to propagate it all over the world. The destruction of any form of life affects the human race itself.

I send my good wishes for the celebration of Wildlife Week 1983.

Indira Gandhi
Prime Minister

“The Survival of man is dependent on the survival of animal and plant life”.

— — —

NATIONAL WILDLIFE ACTION PLAN

The Action Plan contains 10 priority programmes as follows:

- (i) Establishment of a Representative Network of Protected Areas.
- (ii) Management of Protected Areas and Habitat Restoration.
- (iii) Wildlife Protection in Multiple Use Areas.
- (iv) Captive Breeding Programmes.
- (v) Rehabilitation of Endangered and Threatened Species.
- (vi) Wildlife Education and Interpretation.
- (vii) Research and Monitoring.
- (viii) Domestic Legislation and International Conventions.
- (ix) National Conservation Strategy.
- (x) Collaboration with Voluntary Agencies.

For each programme area, the main objectives have been listed and the various priority projects to achieve the objectives have been outlined. The responsibility for undertaking such projects has also been apportioned among the various organisations and agencies.

The National Action Plan has been generally endorsed by the Standing Committee of the Board on its meeting held on 13th September, 1983. However, a few suggestions have been made as follows:

- (1) The co-operation and assistance of non-governmental organisations should be enlisted more fully.
 - (2) Much greater use of television needs to be made.
 - (3) Prior approval of the Central Government for the management plans of the protected areas should not lead to delays. It would be advisable to lay down detailed guidelines for the preparation of such management plans and subject only the plans for biosphere reserves and national parks to scrutiny and approval at the Central level.
 - (4) There should be very close scrutiny of proposals for the construction of buildings in the protected areas.
 - (5) An integrated approach should be adopted in meeting the needs of the local people living in and around the protected areas, for which a special programme should be launched.
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Importance of Wildlife Diseases and Their Control

L.N. ACHARJYO

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Only a few decades ago, the forests were teeming with various species of wildlife. To meet the increasing needs of the growing population more and more forest areas were deforested rapidly for cultivation, industrialisation and urbanisation, thus depriving wildlife of their food and shelter. Besides indiscriminate hunting, poaching, liberal use of crop insecticides, malicious poisoning etc. are also responsible for the decline of wildlife from their natural habitat. Diseases mainly epidemics of viral and bacterial origin have also played an important role in the mortality of wildlife mostly herbivores both in free-living state and in captivity. Though a lot of work has been done on diseases of domestic livestock, very limited work has so far been done on wildlife diseases, their diagnosis, treatment and control specially in our Country.

At present various conservation measures are being taken up to save the wildlife from further depletion such as creation of separate wildlife wings within the State Forest Departments and effective implementation of Wildlife (Protection) Act, 1972, establishment of sanctuaries, National Parks, Zoological Parks, Deer Parks and through various special wildlife projects (e.g. Project Tiger, Crocodile Breeding Project, Sea-turtle Project, Project "Hangul", Ecology and conservation of the Himalayan Musk Deer project, Gir Lion National Park Project etc.). Though heavy losses of our valuable wildlife from diseases are incurred frequently, the study of wildlife diseases has not received as much importance as it deserves.

The study of wildlife diseases is essential for the following main reasons.

(a) FOR THE SURVIVAL OF WILDLIFE

Diseases play a great role at times for the losses of wildlife from the forests as well as in Zoological parks. Several species of wild animals of African countries like wild buffalo, eland, wartlog, giraffe, kudu, roan antelope, bushbuck, duiker, springbok, waterbuck, impala etc. have died from Rinderpest from time to time. Outbreaks of Rinderpest among deer of Brazil and among European bison and deer of Great Britain have been reported.

Incidence of Rinderpest among deer, wild buffalo and wild boars of our country have been reported as early as 1871. Large number of deaths of gaur, wild buffalo, spotted deer, sambar, hog deer, barking deer, barasingha and black-buck have occurred in the forests of our country from Rinderpest. Worst outbreaks of Rinderpest have been reported among

the gaur population of BANDIPUR SANCTUARY (KARNATAKA), MUDUMALAI SANCTUARY (TAMILNADU) and PERIYAR SANCTUARY (KERALA).

Similarly there was a severe outbreak of Anthrax in Assam in 1957-58 and again in 1968 killing several species of free-living wildlife like gaur, spotted deer, hog deer, barking deer, sambar and even elephant and wild pig.

Outbreaks of Haemorrhagic septicaemia among free-living sambar of Sariska (Rajasthan) during 1970-71 were responsible for the death of about 1500 sambar in one year.

Occurrence of Foot-and-mouth Disease among wild ungulates in India is country wide and has been reported from Karnataka, Andhra Pradesh, Madhya Pradesh, Bihar, Kashmir and Himalayan Ranges, Orissa and Maharashtra.

Epidemics of African Horse sickness in November-December, 1961 and probable epidemic of the same disease again in October-November, 1964 might have been responsible for the death of a large number of free-living wild asses of our country. Surra, a blood protozoan disease was responsible for some deaths of wild asses in 1958 and again in 1960 in their natural habitat—Little Rann of Kutch (Gujarat).

There are reports of outbreaks of Rinderpest in Paris Zoo (1965), in Calcutta Zoo (1943), in Lucknow Zoo (1948) and in Rome Zoo (1951). Recently the occurrence of a syndrome simulating Rinderpest at Calcutta Zoo affecting nilgai, gayal and hog deer have been reported. There are many such examples of mortality of wildlife from diseases.

Therefore, proper understanding of wildlife diseases and their role in the population dynamics of wildlife may help in preventing or reducing the losses of wildlife from diseases.

(b) FOR PROTECTING DOMESTIC LIVESTOCK

At times domestic cattle get the infection of diseases like Foot-and-mouth disease, Rinderpest etc. from wild animals while grazing in the forests. In South Africa, advance warning of probable outbreaks of Foot-and-mouth disease among domestic cattle have been received from the observation of the disease among wild animals.

Rabies among livestock in the United States are mostly due to rabid foxes and skunks and in Latin America rabies in cattle is transmitted by vampire bats.

In India wild birds have been suggested as the disseminators of Ranikhet disease. Further detailed studies on wildlife disease and their transmission to domestic livestock may help in protecting them from diseases originating from wildlife.

(c) PUBLIC HEALTH ASPECT

There are many diseases which are transmitted from wildlife to human being. Recent implementation of various wildlife conservation measures necessitate more closer contact

between man and wildlife than ever before. It is necessary for all those dealing with wildlife to have knowledge of these diseases to avoid any probable public health hazard.

Though dogs are considered as the important vectors of Rabies, several species of wildlife like jackal, wild dog, wolf, mongoose, jungle cat etc. are known to transmit the disease (Rabies) to man through their bites.

A virus disease known as Kyasanur Forest Disease was detected in 1957 near Kyasanur forest in Karnataka state. The disease produced prostrating illness and death simultaneously among two species of monkeys (common langur and Bonnet monkey) and man. Ticks of *HAEMAPHYSALIS* spp. are said to be responsible for the transmission of the disease. It is also suggested that small forest mammals like rats, squirrels, gerbils and shrews may be playing a role in transmission of the disease.

Association of man with psittacine birds may produce a disease in man known as psittacosis.

The other diseases which can be transmitted from wild animals and birds to man are Tuberculosis, Brucellosis, Anthrax, Salmonellosis, Listeriosis etc. It is also known that several species of wild birds are capable of disseminating arbo-virus causing fatal diseases among man and animals. Therefore, persons required to handle wild animals and birds are expected to have a preliminary idea of the various zoonotic diseases originating from wildlife.

(d) ECONOMIC SIGNIFICANCE

Diseases play an important role in the population control of some species of harmful wildlife. In England, myxomatosis a virus disease has helped in drastically curtailing the rabbit population and thus indirectly helped both agriculture and forestry. Salmonellosis (cultures of *Salmonella typhimurium* and *Salmonella enteritidis*) was used in Europe for many years to control rodent population and they are still in use in some parts of Eastern Europe. However, World Health Organisation Expert Committee on plague considered this practice as hazardous to man and animals and recommended for discontinuance.

Naturally occurring mycobacterial disease in field voles might be playing an important role on the vole population. But this organism has been used as a prophylactic vaccine against tuberculosis in man.

DETECTION OF ILLNESS AMONG FREE-LIVING WILD ANIMALS

It is difficult to notice any sign and symptom of illness among free-living wildlife as they rarely exhibit symptoms of illness until they are too weak to walk, fly or crawl. However, at times, the following signs and symptoms may be noticed among free-living sick individuals:—

- (i) Isolation of the sick animal from the herd.
- (ii) Suspension of grazing/browsing and rumination among wild ruminants.
- (iii) Less inclination to move or difficulty in movement.
- (iv) Soiled hind quarters indicating diarrhoea.
- (v) Salivation from mouth and lethargy.

DIAGNOSIS

The free-living wild animals are generally found dead without showing any earlier signs and symptoms. Hence diagnosis mostly depends on necropsy coupled with laboratory findings of preserved materials. The history of incidence of disease such as area and place affected, species, sex and age group of the affected animals and birds, number of deaths recorded, period of deaths, pattern of deaths, signs and symptoms of dying animals if observed will definitely aid in proper diagnosis.

TREATMENT AND CONTROL OF DISEASES AMONG FREE-LIVING WILDLIFE

Under the prevailing conditions of our country it is neither practised nor possible to give any prophylactic or curative treatment to the free-living wild animals and birds. If possible the sick individuals may be captured by transquilisation and then kept under confinement for any probable individual treatment.

The history of spreading pattern and mechanism of transmission of disease among free-living wildlife will help in planning effective control measures. In case of an outbreak among wild animals and birds, the following control measures are generally practised:—

- (i) Effective disposal of the carcasses by deep burial with quick lime or by burning.
- (ii) Effective disposal of faeces and other body secretions by covering with quick lime.
- (iii) Disinfection of the instruments and equipments used for conducting postmortem examination and disposal of the carcasses before and after use.
- (iv) All aseptic measures are necessary for conducting postmortem examination of wild animals and birds as in domestic livestock to avoid contamination of the disease among the handlers of carcasses.
- (v) Imposing restrictions on the movement of domestic cattle for grazing in the disease affected forest areas.
- (vi) Periodic vaccination of all cattle (against important infectious diseases) living in and around forests where the wildlife are known to exist.
- (vii) Disinfection of the water holes of the affected area with potassium permanganate/bleaching powder.
- (viii) Arrangements for providing clean water specially during summer months.

FURTHER READING

- Davis, J.W., Karstad, L.H. and Trainer, D.O. (1970). Infectious diseases of wild mammals, The Iowa State University Press, Ames, Iowa, U.S.A.
- Davis, J.W., Anderson, R.C., Karstad, L.H. and Trainer, D.O. (1971). Infectious and Parasitic diseases of wild birds. The Iowa State University Press, Ames, Iowa, U.S.A.
- Singh, C.M. (1978) Health perspectives for wildlife conservation, J. Bombay nat. Hist. Soc. 75, 1262-1267.
- Sinha, S.K. (1976). Wildlife losses due to diseases in Indian wild animals, Cheetal-Journal of Wildlife Preservation Society of India, 17: 25-38.

Stray Notes on Ornithology in India

ALLAN HUME, C.B.

Grus leucogeranus, Pallas (Siberian Crane)

Of the four beautiful species of Cranes which permanently, or as seasonal visitants, adorn our Indian plains, the rarest and perhaps the finest is the *Grus leucogeranus*, the Great White or Siberian Crane.

Those who are acquainted with this graceful and exquisitely shaped bird only through the medium of Mr. Gould's figure, or the copy of that figure which Dr. Bree has given, can form no just idea of it.

Large and white, with a good deal of red about the face, they doubtless know it to be; but if they attempt to realize it further, it must be as an awkward gawky creature to whom neither its legs nor head seem properly to pertain. In reality, however, it is the most elegant of birds; and, stand in what position it may, the whole outline of its head, neck, and body presents a series of the most graceful and harmonious curves. The Common Crane of Europe (*Grus cinerea*) with its magnificent pendent train, the delicate Demoiselle (*Anthropoides virgo*) with jet-black waving neck-plumes and silvery ear-tufts, the stately Sarus (*G. antigone*) with its exquisite lavender hue, and brilliant crimson head surmounting its white neck-band—all seem to me to yield the palm to the grace and dazzling whiteness of *G. leucogeranus*.

Few birds are more wary, few have been seldomer procured. Accurate and detailed measurements (such as will be found at the end of this paper), made from numerous fresh specimens, have never yet, I believe, been published; nor, as far as I know, has any correct account been ever given of its habits, food, voice, or changes of plumage.

Sixteen years have now elapsed since I first shot one in Ladakh (in the Himalayahs). This was in October; and the birds were doubtless then on their way to the plains of India. They arrived at a lake near Ley, close to which I was encamped, towards nightfall; and though, after I had fired at them and secured a specimen, they again settled at some distance, they took their departure next morning before noon without being further molested. At the time I was unfortunately too much of a mere sportsman and too little of a naturalist to take much note of a bird which had nothing gamelike in its plumage, and which proved unfit for the table.

Years passed away, during which (gun in hand though I always was when I could spare the time or could get leave) I never once met with a single specimen of the bird. Soon

after the mutiny, however, in 1859, I succeeded in shooting one out of a flock of some five and twenty, which I found in a large "jheel" or shallow rain-water lake, in the north of the Etawah district, about halfway between Agra and Cawnpore.

During the winters of 1865-6 and 1866-7 I have procured and preserved a number of specimens in the same neighbourhood, and have had many opportunities of watching them pretty closely.

They are very probably to be found during the cold weather in suitable localities throughout the plains of the north of India; but the only place where I have observed them out of the Himalayahs, is in a tract of country lying to the north of the Etawah and south of the Mynpoorie districts, in the middle of the "Duab," or *Mesopotamia*, of the Ganges and Jumna, and, as I said before, about halfway between Agra and Cawnpore.

That they themselves are rare, and that localities suited to their tastes are not numerous, may be inferred from the fact that, apparently, Dr. Jerdon, when he published his work, had never seen one; while, as far as I know, until I last year sent a pair to Madras, there were no specimens in any of our museums. The locality in which, during these last two winters, I have seen and procured, comparatively, so many of these beautiful birds is somewhat peculiar. A broad straggling belt of Dhak (*butea frondosa*)-jungle, some ten miles in width—at one time doubtless continuous, but now much encroached upon and intersected in many places by cultivated lands, runs down through nearly the whole of the "Duab", marking, I suspect, an ancient river-course. Just where the northern and southern boundaries of the Etawah and Mynpoorie districts lie within this belt, the latter encloses a number of large shallow ponds or lakes ("jheels" as we here term them) which, covering from two hundred acres to many square miles of country each at the close of the rainy season, are many of them still somewhat imposing sheets of water early in January. and some few of them of considerable extent even as late as the commencement of March. Mohree Southenan, Mamun, Sirsau Nawur, Kurree, Beenan, Soj, Hurrera, Suman, Kishnee, Phurenjhee, are some of the largest of these rain-water lakes, many of which abound with rushes and sedges, and, as the waters gradually dry up or are drawn off for irrigating-purposes, become successively the favourite haunts of the White Crane.

There will always be at any particular time two or three "jheels" that for the moment they particularly affect; and these are as a rule just those that then happen to average about eighteen inches to two feet in depth, and that have a good deal of rush (*Scirpus carinatus* amongst others) somewhere in the shallower parts.

To this tract of country they make their way as early as the 25th of October (and possibly sooner, though this is the earliest date on which I have observed them); and there

they remain at least as late as the end of March, or perhaps a week or two longer. During the whole of our cold season they stay in this neighbourhood, and, though growing more and more wary (if possible) each time they are fired at, and disappearing for a day or two from any "jheel" where an attempt has been made to kill or capture them, they never seem to forsake the locality until the change of temperature warns them to retreat to their cool northern homes. Week after week I have noticed, and repeatedly fired at, sometimes even slightly wounded particular birds, which have nevertheless remained about the place their full time; nay, I have twice now killed the young bird early in the season, and the parents, one by one, at intervals of nearly a couple of months.

The Buhelias, a native caste of fowlers (and, I fear I must add, thieves), of whom there are many in the neighbourhood, and who are keen observers of all wild animals, assure me that, as far back as any of them can remember (namely, for at least the last fifty years), parties of the White Crane or, as they call them, "*Karekhurs*"* have been in the habit of yearly spending their winters in the same locality.

Though occasionally in larger flocks, it is usual to find either a pair of old ones accompanied by a single young one, or small parties of five or six, which then, as far as I can judge, consist exclusively of birds of the second year.

The fully adult birds are, even when they first arrive, of snowy whiteness; and each pair is almost without exception accompanied by a young one, which, when first seen, is of a sandy or buff tint throughout†, and very noticeably smaller than its parents. The males are considerably larger and heavier than the females, the adults of the former weighing upto 19 lbs., but of the latter only—as far as my experience goes—to about 16 lbs. In length, too, the male is sometimes close on 56 inches, with an expanse of 100 inches; but out of eight adult females examined, these dimensions in none exceeded 53 and 92 inches respectively. Of the young birds, however, when they first arrive, the males do not exceed about 10 lbs. in weight, and the females 9 lbs, though generally very fat and well cared for by the parents.

* Professor Max Muller justly ridicules the excessive length to which what he denominates the "Bow-wow theory" of the origin of words has been pushed by some comparative etymologists; but, in the case of the Cranes, the Hindu names in use, in this portion of northern India, clearly owe their origin to the cries of the several birds. Thus, *Grus cinerea* is called "Koorooouch", or "Koorch"; *Anthropoides virgo*, "Kurrkurra"; and *G. leucogeranus*, "Karekhur"; each of these names, when pronounced by a native, being an appreciable imitation of the cry of the particular species it serves to designate.

† [Compare Mr. Wolf's clever figure of the young *Grus montignesia*, a very closely-allied species, hatched in the Zoological Gardens (P.Z.S. 1861, p. 369, pl. xxxv.).—Ed.]

When we first saw them, they cannot, I estimate, be more than six months old. The testes and ovaria of adults examined this year, on the 20th of March, were still, if I may use the term, quite dormant; and, allowing for the "passage home", the pairing-season, and incubation, they can scarcely hatch off before the middle of May.

They never appear to have more than one young one with them; but it does not at all follow that they do not lay more than one egg. Our commonest Indian Crane, which usually lays two, and sometimes, though rarely, three eggs, and which has no long or arduous journey to perform, seldom succeeds in rearing more than one young one.

Judging from those of its congeners whose breeding-habits are best known to me—*G. antigone* and *G. australasianus*—as also from what is recorded of the Common* and Demoiselle Cranes (whose nests I have never myself taken), I should suppose that they lay two eggs; but, if this be the case, I can only say that out of more than a hundred pairs that I have seen, from first to last, I never yet saw any with more than one young one.

The watchful care and tender solicitude evinced by the old birds for their only child is most noticeable. They never suffer the young one to stray from their side, and, while they themselves are rarely more than thirty yards apart, and generally much closer, the young, I think, is invariably somewhere between them. If either bird find a particularly promising rush-tuft, it will call the little one to its side, by a faint creaking cry, and watch it eating, every now and then affectionately running its long bill through the young one's feathers. If, as sometime happens, the young only be shot, the old birds, though rising in the air with many cries, will not leave the place, but for hours after keep circling round and round high out of gun or even rifle-shot, and for many days afterwards will return apparently disconsolately seeking their lost treasure.

Like the Sarus, these birds pair, I think, for life, at any rate, a pair whose young one was shot last year, and both of whom were subsequently wounded about the legs, so as to make them very recognizable, appeared again this year, accompanied by a young one, and were at once noticed as being our wary friends of the past year by both the native fowlers and myself. I was glad to see they were none the worse for their swollen, crooked, bandy legs; and this year at least they have got safe home, I hope, with their precious charge,

The worst of ornithology is having to kill birds like these. For birds of prey that one shoots so often in the act of tearing some helpless innocent victim to pieces, one has little compunction; but with gentle vegetable-eating birds like these, who seem to love each other so well, and so much, and who for so long evince their sense of the loss of any of the family party, the case is different, and no feeling man can kill any of them, I think, without a pang. As for myself, nothing but the rarity of these birds, the paucity of information in regard to

them, and their being *desiderata* in so many important museums, could have induced me to kill so many of them as I have; and I sincerely hope I shall never need to kill another. I do not know how it is; but I have often wished that I could be quite sure that the wholesale murder of these and similar innocent animals merely for scientific purposes, and not for food, was quite right. Intellectually, I have no doubt on the subject; but somehow, when a poor victim is painfully gasping out its harmless life before me, my heart seems to tell me a somewhat different tale.

Throughout their sojourn here, the young remain as closely attached to their parents as when they first arrived; but, doubtless, by the time the party return to their northern homes the young are dismissed, with a blessing, to shift for themselves.

Long before they leave, the rich buff or sandy colour has begun to give place to the white of the adult plumage, and the faces and foreheads, which (as in the Common Crane) are feathered in the young, have begun to grow bare. This, I notice, seems to result from the barbs composing the vanes of the tiny feathers falling off and leaving only the naked hair-like shafts. Even when they leave us, however, there is still a good deal of buff about the head, upper back, lesser and median wing-coverts, longer scapulars, and tertials of the young, while the dingy patch along the front of the tarsus is still well marked.

Each year several small parties of birds are noticeable un-accompanied by any young ones, and never separating into pairs. These, when they first come, still show a few buff feathers, and have a dingy patch on the tarsus; and though before they leave us they become almost as purely white, and have almost as well-coloured faces and legs as the old ones that are in pairs, they never seem to attain to the full weight of these latter. From these facts I am disposed to infer that there porties, which include individuals of both sexes, consist of birds of the second year, that our birds do not either breed or assume their perfect plumage till just at the close of their second year, and that, like Pigeons and many others, they do not attain their full weight until they have bred once at least.

Unlike the four other species of Crane with which I am acquainted, and which I have above mentioned, *Grus leucogeranus* never seems to resort, during any part of the day or night, to dry plains or fields in which to feed; and, unlike them too, as far as my experience goes, it is exclusively a vegetable-eater. I have never found the slightest traces of insects or reptiles (so common in those of the other species) in any of the twenty-odd stomachs of these White Cranes that I have myself examined.

Day and night they are to be seen, if undisturbed, standing in the shallow water. Asleep, they rest on one leg with the head and neck somehow nestled into the back; or they will stand like marble statues, contemplating the water with curved necks, not a little

resembling some white Egret on a gigantic scale; or, again, we see them marching to and fro, slowly and gracefully feeding amongst the low rushes.

Other Cranes, and notably the common one and the Demoiselle, daily pay visits in large numbers to our fields, where they commit great havoc, devouring grain of all descriptions, flower-shoots, and even some kinds of vegetables. The White Crane, however, seeks no such dainties, but finds its frugal food, rush-seeds, bulbs, corns, and even leaves of various aquatic plants, in the cool waters where it spends its whole time.

Without preparations by me for comparison, I hardly like to be too positive on this score; but I am impressed with the idea that the stomach in this species is much less muscular than in any of the others with which I am acquainted. The enormous number of small pebbles that their stomachs contain is remarkable. Out of an old male I took sufficient very nearly to fill an ordinary-sized wine-glass, and that, too, after they had been thoroughly cleaned and freed from the macerated vegetable matter which clung to them. These pebbles were mostly quartz (amorphous and crystalline), greenstone, and some kind of porphyritic rock; the largest scarcely exceeded in size an ordinary pea, while the majority were not bigger than large pins'-heads. Perhaps, in the hands of some abler mineralogist than myself, these tiny fragments (of which I have a small bag full) may prove to contain as yet unnoticed mineral forms from Central Asia.

I have found similar pebbles in the stomachs of the Grey and Demoiselle Cranes, but never in anything like such numbers as in those of the present species.

When not alarmed, the White Crane's note is what, for so large a bird, may be called a mere chirrup; and even when most alarmed, and circling and soaring wildly round and round, looking down upon the capture of wounded offspring or partner, their cry (a mere repetition of the syllables "*Karekhur*") is very feeble as compared with that of any other of the Cranes (including even *Balearica pavonina*) whose notes I have myself ever heard.

An examination of the trachea of a fine male that I dissected on the 22nd of February, this year (1867), at once explained this feebleness. Instead of a convolution entering and running far back into the sternum, there is merely a somewhat dilated bend just where the windpipe enters the cavity of the body; and it is only after the pipe has divided, which it does symmetrically into two very nearly equal tubes, about 3 inches before entering the lungs, that the rings are at all strongly marked, or that the tube impresses one as at all powerful.

I have already noticed that it is not easy to get at these birds (possibly due in part to a keen sense of hearing accompanying their large ear-orifices); and, as far as my experience goes, there is only one way of shooting them with a shot-gun. With a rifle it is not difficult

to get within two-hundred-and-fifty to three-hundred yards of them, at which distance, with a heavy .442 match rifle, one ought to knock them over every time. The melancholy fact, however, is, that habitually one only succeeds in missing them and thoroughly scaring them with a rifle; so nothing remains but to have recourse to a long single eight-bore with BB green cartridge. This will easily knock them down up to seventy, or, if a shot tells well in the neck, up to eighty yards; but getting within eighty or even a hundred yards of them can only be managed, as a general rule, in one way. You obtain from one of the native fowlers the loan of a trained Buffalo, and enter the water a good quarter of a mile away from the birds, under cover of the quadruped. It has, as usual, a string run tightly through the nostrils and tied together behind the horns. You hold this string where it lies across the check with the left hand; your extended left arm is hidden behind the neck; your whole body is bent, so that your head and neck are covered by the Buffalo's-shoulders, your body and the greater part of your legs by its body. Only your legs to a little above the knees show close to the hind legs; and as far as possible you always keep the beast up to his belly in water. Thus covered you slowly sidle up towards the Cranes, making the buffalo now put his head up, nose in air, now stop and lower his head to the water, and generally dawdle and meander about with apparently no fixed idea in his head, according to the natural manners and customs of a free and independent buffalo. With a little practice it is easy thus to get within shot. You softly let the check-string go, and at once fire below the buffalo's neck. Before your gun is well off, your sporting companion—who has a marked distrust of Europeans and white faces, and has been incessantly endeavouring to kick you throughout your whole promenade—knocks you head over heels, and rushes off towards his dusky owner, bellowing as if he, and not you, were the injured party. This is first-rate sport; but, after trying it once or twice, nearly catching my death of cold, losing a powder-flask, and realizing a stock in trade of bruises enough to last the rest of my natural life, I have preferred sitting quietly on the bank and allowing my native coadjutors to shoot the birds I wanted.

When shot they are worth nothing as food; which, considering their diet here, is not surprising.

In Europe, nowadays, the Common Crane is not thought worth eating, and people wonder at our ancestors esteeming them as they did; but the reason of this is obvious. In former days, when they were so numerous in Norfolk and other English counties, they used, I apprehend, to arrive at the time of wheat-harvest, and feed exclusively on grain. Grain-fed Cranes are delicious. The Common Cranes that have lately left us, and which, for two months, had been daily gorging themselves in our fields on grain of various kinds, were fat, juicy, tender, and delicately flavoured—in fact, to my mind, with the exception of a Florican (*Otis deliciosa*), or one of our Norfolk Pheasants, about as good birds as can be put on the

table, and this although five or six months before, when they first arrived, they were stringy, tough, lean, fishy things, not worth eating, or shooting even, except for plumes.

I ought not to omit to notice that, out of more than twenty specimens of the White Crane that I have procured (between October and the middle of March), none had the tertials at all conspicuously elongated; and in no instance did these, when the wings were closed, exceed the tail-feathers or longest primaries (which usually reach just to the end of the tail) by more than 3 inches. It is possible that at the breeding-season the tertials may be much more developed; but such is not the case with the Sarus, nor, I fancy (to judge from the magnificent trains of plumes with which we here shoot them in the winter), with the Common Crane.

The feathers of the hind head and nape are somewhat lengthened, so as to form a full and broad though short suberest, very noticeable when a wounded bird is defending itself against dogs or other assailants. It is a brave bird, and fights to the last, striking out powerfully at times with bill, legs, and wings, but most generally defending itself chiefly with its bill, with which it inflicts occasionally almost serious wounds.

Subjoined are descriptions of both old and young, and a Table of dimensions of adults of both sexes.

The legs and feet are a dull pale reddish-pink (dullest in the young), varying to dull red, somewhat brighter on the feet. In all but the old birds, the front of the tarsus, the ridges of the toes, and the bare portion of the tibia in front, are tinged (the first strongly, the others faintly) with dark brown, which, in some, on the front of the tarsus takes the form of a black mottling: even in the old bird a trace of this is often visible on the front of the tarsus. The claws are rather massive, with the inner edge of the middle toe claw somewhat dilated. They are blackish or dark horny-brown. The scutellation of the bare portion of the tibia, of the tibia-tarsal joint, of the back of the tarsus, and the sides of the feet and toes is reticulate, the scales on the front of the tibia and back of the tarsus being very large and concave, the lines of junction forming a raised network. The front of the tarsus has broad transverse plates, with the upper margins convex. The ridges of the toes have well-marked transverse scuta. The middle and outer toes are connected by a thick reticulate scaled membrane, as far as the first joint (from base). The irides are a bright, very pale yellow; the colour does not vary with age; but in some birds the iris is almost silvery, and in others there is a pinkish tinge.

The bill is umber-brown, very smooth and polished, solid-looking towards the end, and generally with the edges of both mandibles for an inch or an inch-and-a-half from the tip regularly notched, or bluntly toothed at intervals of about $\frac{1}{25}$ in. so as to present the

appearance, especially on the upper mandible, of regular though tiny scollops. A row of blunt teeth-like protuberances, pointing backwards, runs down the centre of the palate.

The tongue is hastate, but narrow, sharp-pointed, and membranaceous towards the tip, which is slightly fringed, and thick, fleshy, and cylindrical beneath, towards the base.

The ear-orifices are very large and oval, reminding one of those of the Owls and other birds of prey.

The membrane of the nasal groove is red, much the same colour as the face, and like the later, dingier in the less-mature birds. In the adult the forehead, lores, and cheeks are naked, of a dull reddish hue, pretty thickly set with short yellowish hairs. In some old birds, the hindmost of these hairs, just where they meet the white feathers, are longer and thicker than elsewhere, and of a brownish hue, thus producing the appearance of a narrow brown line, dividing the snowy feathers from the bare red space.

The plumage, as a whole, is of a most brilliant white; but the primaries and their greater coverts are black, above which the lesser coverts are white, while above these, again, the winglet also is black. The first three or four secondaries have also very often a blackish-brown patch towards the base, on one or both webs, largest on the first, and diminishing on each succeeding feather, and rarely traceable beyond the fourth.

The earliest of the greater coverts of the secondaries have not unfrequently similar patches; but I suspect that these patches are the last lingering traces of the less-perfect plumage.

In the young there is no bare space about the face. The whole head and upper half of the neck are of a somewhat rusty buff. The space destined later to become bare, however, is, in the youngest specimens that I have seen, well defined, its clothing feathers being of a browner and dingier hue than those of the rest of the head, and sitting much closer to the skin. The buff is clearest and deepest on the cheeks and the top and back of the head, and very pale on the chin and throat. The rest of the plumage, when we first see the young birds, may (excepting the primaries and their greater coverts and winglets) be described as buff, in some places brighter and more rufous, in others duller and sandier, with white everywhere beginning to peep through it.

By February, though still much varied by buff, the white predominates in the body-plumage. At this time many of the feathers of the back of the neck and upper back are still pure buff, and many others are more or less tinged with this colour. Many of the longer scapulars, tertials, and hindmost of the secondaries are also buff, while the upper tail-coverts, and most of the lesser and median wing-coverts are tipped with it, and the patch of

coverts just above the winglet is usually entirely ferruginous. There is a very faint tinge of buff on some of the feathers of the breast, and many of the thigh-coverts are wholly rusty. By the end of March, when the birds are nine or ten months old, the face has begun to grow bare; and though there is still some buff in the parts above mentioned, it has become markedly less in extent, and feebler in tint.

Table of Dimensions

	Male		Female	
	From	To	From	To
	inches	inches	inches	inches
Whole length* ...	56	52	53	48
Expanse ..	99·5	90	92	83
Wing ...	26	23	24	22·5
Tail from vent ...	9·5	8	8·25	7·75
Tarsus ...	12	11	11·5	9
Bare portion of tibia ...	5·5	5	5·5	4·5
Foot, greatest length ...	7·5	7	7	6·875
———, ——— width ...	8·5	8	8·25	7·75
Middle toe ...	5	4·25	4·5	4·0625
———, its claw ...	·7711	·75	·6875	·5937
Hind toe ...	1·125	1	1	·9375
———, its claw ...	·5	·4375	·4375	·375
Bill ...	7·75	7·5	7·5	6·5
Gape ...	8	7·75	7·625	6·75
Width of gape ...	1·3125	1·125	1·125	1·125
Height of bill ...	·9375	8·75	·8437	·8437
Weight ...	19 lb.	16 lb.	16 lb.	12·5 lb.

Agra, June 4th, 1867.

On the Occurrence of the Himalayan Mouse-hare in Spiti Valley of H.P. India

By

RATHIN MUKERJI AND K.K. MAHAJAN

While we were halting at Batul (alt. c 3.659 m) for transshipment (as the heavy vehicles were not allowed to cross over the bridge on the river Chandra, one of the tributaries of Chandrabhaga i.e., The Chenab) on our way to Kaza (Distt. H.Q. of Spiti Sub-Division, Distt. Lahul Spiti H.P.), we observed that some children of Tibetan road workers were playing hide and seek game with some brown coloured guineapig like small animals. We became very curious and interested about those small mammals naturally, so we joined them. Ultimately we chased and cornered easily two of these mammals among the roadside loose stone boulders and rock cleavages. When captured these two mammals with small rounded head, rounded ears, short muzzle and without any tail, we immediately recognised them as Pika, the piping hare, *Ochotona*, later further detail closer study confirm their identity as *Ochotona roylei roylei* (Ogilby).

Ochotona roylei roylei (Ogilby)

(Mammalia : Lagomorpha : Ochtonidae)

Description:- The hair, fine, straight and glossy, colour above brown, lower parts paler. Basal fur almost throughout the body leaden black, rest of the longer hair faded brown but the upper parts deep brown tips. Feet pale brown above, hind foot soles darker brown.

Measurement:

Head and Body:- 168 mm. Tarsus and hind foot-33 mm. Ear-L. 122 mm, B. 19 mm. Skull-37.5 mm Zygomatic width 16 mm.

According to extant literature available there are 18 species of Pika inhabiting vast parts of Asia from the easternmost edge of Europe in Volga region to Japan Tibet and Burma including the great Himalayan mountain range. The original description of the species by Ogilby was based on the specimens from Kashmir. The distribution mentioned by him were Kashmir, Kumaon and Tibet. The renowned naturalist and geologist Col. F. Stoliczka (member of the Yarkand Mission 1869) reported it from Zaskar range, later Przewalski recorded it also from N.E. Tibet. The present finding however, constitutes the first authentic record of this species from Spiti Valley of Lahul Spiti, Himachal Pradesh.

The senior author is deeply indebted to Shri R.K. Ghosh and S.S. Saha for their constant encouragement and guidance.

References

- Ellerman, J.R. and Morrison-Scott, T.C.S. 1951. Check list of Palaerctic and Indian Mammals. 1758-1946. British Museum. London. P. 451.
- Hanak Vladimir and Mazak Vratislav. 1979. The illustrated encyclopedia of Mammals. Octopus. London. P. 257.
- Ogilby, W. 1831. Royle's Illustrations of the Botany and other branches of the Natural History of the Himalayan Mountains. London. LXIX, Pl. 4.
- Stoliczka, F. Ornithological observations in the Satluj valley. *Jour Asiat. Soc. Beno.* 37 (ii) : 1.

TSO-Chen, Feng and Yush-Ting, Kao. 1974. Taxonomic notes on the Tibetan Pika and allied species including a new sub-species. *Acta Zoologica Sinica.* 20 (1) : 76-87.

**Convocation Address delivered by the Chief Guest, Lt. Col.
Fatehsinghrao P. Gaekwad, President, World Wildlife Fund—
India, and Life Member, Wildlife Preservation Society of
India, on Thursday, August 11th, 1983, at the Wildlife
Institute of India, Dehra Dun**

Shri Saharia, distinguished guests, Officers of Diploma Course in Wildlife Management, Ladies and Gentlemen,

I am deeply conscious of the honour that you are bestowing upon me by having me as Chief Guest at the first Convocation of the Wildlife Institute of India. During the unfinished chapter in my life, which started exactly 28 years ago, as a deeply committed Conservationist, fewer occasions have given me greater pleasure than being present here today.

Over the years, I have acquired a reputation of being a man of few words, of one who does not mince those words, and of one who believes, especially when it comes to subjects like conservation, and if you will pardon the expression, in shooting straight from the shoulder. Not being either a scientist or an expert on the subject, I must confess that at some times I do get terribly confused with words like ecology, eco-systems, biosphere, environment, etc. All that I can understand and I am deeply convinced in is that we have to ensure that the planet we live on must be so managed that it sustains all life on earth without creating any imbalance of any sort. I also firmly believe that of all creatures on earth, it is Man's duty and prime responsibility to see to this. Man is the only animal who appears to be fit enough, in all senses of the word, and qualified to undertake this responsibility.

Why have we all gathered here today ? Not just to confer diplomas, to make long and boring speeches or to meet each other ? We are all here because we are deeply concerned with the fact that Man is not carrying out his duty and responsibility properly, but is on a course of a systematic destruction of this very imperative objective. Carnivora or poisonous reptiles are not our enemies. Our fellow-beings on the surface of this planet are not our enemies.

We are alarmed when we are told that the desert is advancing, that forest life is being denuded, that air, water and land are being polluted. Every year some parts of our great country suffer from drought, others from floods and cyclones. The moment this happens, we rush to label them as natural disasters, putting the entire blame on Nature. Who is really responsible for this ? The answer is wellknown and straightforward. By blaming Nature all that we are doing is shirking our responsibility. 'It is Man who is his own worst enemy'.

Science has taken man to the moon and he will be shortly landing on many other planets, but the ones we know including the moon, are totally uninhabitable. When we have achieved the destruction of this planet, there is not going to be any other place to go to. But enough of this. I hope my message has come to you loud and clear. Let me, therefore, come to the limited purpose for which we are all here this afternoon. Let us examine the situation as it exists in India today and see how you, the new diploma-holders, can apply your new knowledge to the pressing problems facing us.

We have a rich heritage of wildlife and we lose no opportunity to proclaim this fact to the world from our housetops. Our scriptures, Indian mythology, all forms of art, folklore, etc. are full of references to animal and bird life and beautiful descriptions of our forests, mountains and rivers. Every Hindu God or Goddess is intimately connected with wildlife, Lord Ganesh with the elephant, Lord Shiva with the cobra, Goddess Laxmi with the lotus and Goddess Kali with the tiger. The Hindu spends lavishly on the worship of these deities, but has conveniently forgotten the wildlife that is connected with them.

Today in our relentless march towards development, we are rapidly depleting the earth's natural resources. Man's activities have disturbed the environment and destroyed the natural balance with scant regard to its consequences. The biotic communities over land and in water are fast disappearing. Some of our wildlife species have been wiped out and over 90 vertebrate species and sub-species and an estimated 120 plant species in India are threatened with extinction. Large areas of wildlife habitats have been lost to other forms and land use by man. Wildlife is a natural resource. No one can predict when a species may become important for the survival of humanity. The history of human use of plant and animal species has demonstrated that vanishing and apparently insignificant species can suddenly become useful and important. Conservation is no more a concern confined to national boundaries. The patterns of resource use have changed from local to global patterns. It will not be merely our national tragedy but a world-wide misfortune if any more of our wildlife species become extinct.

The most serious threat to wildlife is habitat destruction, the over-utilisation, introduction of exotic species and uncontrolled international trade have become a threat to many a species. The insatiable hunger for more and more land for cultivation, growing urbanisation coupled with stresses generated by unrestricted grazing of livestock, forest fires, lopping of trees, mining, etc. have resulted in the devastation of our natural environment and renewable resources, including wildlife. The soil is being stripped of the cover of trees, grass and other forms of vegetation that protect the land under natural conditions. Soil erosion is a natural and continuous process, but only in undisturbed eco-systems. With a protective cover of plants, the soil is usually regenerated at the same rate as it is removed. Imbalance causes accelerat-

ed erosion resulting in natural disasters. Pollution of water, the life-stream of biotic communities, is reaching alarming proportions. A developing nation like India faces the long and arduous job of restoring these resources for meeting the needs of its future generations. It is high-time that as custodians of our natural resources the vital linkage between the ecological management of natural environments and development activities of the nation is given a scientifically rational treatment. Development of the nation has to be achieved without despoiling nature of its beauty. As stated earlier, we have a special responsibility to safeguard and wisely manage our natural heritage. The conservation of our natural environments must receive importance in the planning of the economic development of the country.

Wildlife is also an important source of subsistence as well as recreation in both developed and developing countries. Many wild plants and animals of the land can be viewed as important renewable and utilisable resources, particularly for rural and forest-dwelling communities in developing countries.

The World Conservation Strategy, treats conservation as the management of the human use of the biosphere so that it may yield the greatest sustainable benefits to the present generation while maintaining its potential to meet the needs and aspirations of future generations. Forest management in India has for long followed the concept of sustained yield harvesting and regeneration of forests under natural conditions. This was in consonance with the conservation ethics propounded in the World Conservation Strategy. Socio-economic factors and the population explosion result in rising demands on raw materials from forests by industries and the mounting gap between the demand and supply of forest products. They brought in the new concept of 'production forestry' as outlined by the report of the National Commission on Agriculture in 1969. This has necessitated scientific planning, allocation and management of land and water uses supported by on-site preservation of natural gene-pools in protected areas and off-site protection in areas such as zoos, botanical gardens and arboreta. Protected areas can achieve better preservation of natural communities and diversity of species than the off-site protection. Unique eco-systems have to be protected as a matter of priority. In addition, a network over complete range of eco-system representatives of different floral and faunal associations in each biotype need to be protected so that the range of diversity in nature is preserved. Only such uses that are compatible with the preservation of the eco-systems and their component communities of plants and animals should be permitted in areas protected for these purposes.

The World Conservation Strategy also links wildlife conservation with development and the monitoring of environmental impacts of developmental works on natural eco-systems. This includes studies of impact of projects like hydro-electric and irrigation works, mining and diversion of forest lands for other land uses. If natural forest areas are felled for rais-

ing plantation crops or exotics the impacts on species of wild plants and animals have to be monitored. Conservation also has social, economic and cultural dimensions. The patterns of resource utilisation in human societies living within or in close proximity of forest and wildlife habitats have a great bearing on the conservation of plants and animals. Some of these like the shifting cultivation, uncontrolled livestock grazing and fuelwood collection may be highly destructive to the eco-system, though they are basic needs within the existing socio-economic structure of these societies. It is heartening to note that these aspects are being taken care of in the Wildlife Management Training Course.

However, there are obstacles, and great ones at that, to be overcome before conservation can become an established social practice in India. Short-sightedness in planning is one of the fundamental obstacles to the adoption of conservation practices. Species and ecosystems should not be so heavily exploited that they get down graded to levels from which they cannot easily recover. Another great obstacle to conservation is the constant tendency of the human race to seek superficially promising ways out of difficulties rather than to face the facts and undertake drastic remedies. Since, the pollution of wildlife has decreased in this country, mere legal actions will not serve the purpose. The solution lies in the restoration of the natural environment. The time and effort spent in restoring of food and cover in their right relationship will result in increased natural production indefinitely. Establishment of sanctuaries, and national parks is also not an end in itself. These parks and sanctuaries must serve as field laboratories for man's understanding of the natural eco-systems, and how his activities effect them. Although forest working plans contain basic information on forest types and flora and fauna, for most of the managed forests, base-line data on inter-relationships of plants and animal communities, impacts of silvicultural practices on wildlife habitats status survey and population dynamics of wildlife species etc. has to be built up. You, as trained managers, have to take up these tasks. Laws have been enacted and will go on being enacted. These may be beautifully drafted, but they can only become efficient with proper and strict implementation. They must be treated as basic guidelines. To make them effective and functioning lies in our hands.

A strong and persistent conservation movement is essential as, in India, it is yet to evoke the mass support and mass awakening which is so characteristic of the conservation movement in the West. Even as a part of our development planning strategy, the concept of environmental conservation is more concerned with the impact of industry and technology upon the environment, particularly the air, water and soil pollution through industrial effluents. The vast majority of the public is quite indifferent to the success or otherwise of wildlife conservation. Most individuals are so absorbed in their own occupation or avocation that they fail to appreciate the importance of the conservation of the natural resources to themselves and to their progeny. The ever-shifting pressures and changing economic and social needs are constantly creating new and continuing conservation

problems. For more and more people to understand and appreciate the need of conservation, it is essential to educate them right from the 'cradle to the grave'.

The conservationist with his powerful message must attack all sections of society irrespective of class, creed, age or sex. A strategy on a war-footing needs to be carefully planned. Our objective is to win the war, but each battle won is a step towards the end. I will tell you the strategy that I have evolved. It is in 2 parts—immediate and long term. My immediate targets are decision makers, those who are in charge implementing policy and the student population. All the rest are covered by my long term objective.

The greatest need today is for alert and intelligent conservation groups and programmes so that no radical alteration in vegetation or other conditions are brought about. Much damage may be averted if drainage projects, the construction of huge dams, the establishment of industries that increases pollution are planned in a manner that disturb the environment the least.

It is here that a study of the structures and functioning of the eco-system becomes important in terms of evaluating the environmental impact of any development projects. This environmental analysis can be carried out only by technically trained people at the district level project. You, the Officers who are passing out today have an important role to play in this connection. Eternal vigilance will have to be maintained in order to ensure that the natural resources are never again exploited to the point of destruction.

There is a great need for scientific research to assist you in your work. The time may never come when it will be possible to rest secure in the knowledge that all conservation problems have been solved. With the establishment of a fullfledged Wildlife Institute, the scientific training of Wildlife Managers has come a long way from its starting point of a certificate course of 6 months duration in the Indian Forest College in 1970. I am sure that the technically trained officers from this Institute will constantly apply themselves to the solution of conservation problems for scientific use of forests and wildlife resources and restoration of environmental conditions. A wildlife manager is basically an environmental manager for natural eco-systems and not just a manager of animals and game.

I congratulate all the officers on their successful completion of their training and wish everyone of you bright success on the eve of your embarkation on an arduous job as trained professionals in wildlife management. Oh, how I wish I was in your shoes!

Ladies and gentlemen, I hope I have not bored you. It is rarely that I get an opportunity like this to give vent to my feelings before an audience committed to conservation. Being a politician, I am an opportunist. I hope my opportunism for a good cause is not misunderstood.

In the end, I must thank Shri Saharia, for kindly giving me the opportunity and honour to address the officers who are going to play a vital role in the conservation of living resources.

Vegetal matter in Indian Wild dog (*Cuon alpinus* Pallas) faeces

By

P.C. KOTWAL

Research Officer, Kanha

While going on a park round in Kanha National Park on 5-11-81 at 6.00 A.M. to look for wild dogs, a pack of 8 wild dogs was seen in Desinala. They were playing in the sandy nalla bed and on seeing the jeep on the road closeby started moving towards the sal forest along Sijhora road. After about 300 yards, they crossed the road to the other side. One small sized dog defaecated on the road. It took him about two minutes to drop the matter with great difficulty. The dropping remained lingering for quite sometime and the dog took 5-6 clock-wise turns in a bid to pull away the lingering scat from anus by his mouth. The dog could bend the body but his mouth could not reach the place. In doing so, the matter dropped on the ground. The dog smelled the scat, spread it little bit by his mouth. In this operation the dog lagged behind the pack, so he moved towards the pack. The whole phenomenon was witnessed from jeep about 20 yards away. On observing the scat it was found that there was a lot of vegetal matter. The scat was collected for analysis while it was still warm. The colour of the scat was pale brown.

The scat was thoroughly washed in water to isolate the vegetal matter and hairs of prey animals. It contained leaves, inflorescence and roots of *Bothriochloa odorata* and a flowered piece of *Rungia pectinata*. The scat contained very few hairs of chital and rest was water soluble matter, may be soil. Any eggs of endoparasites, could not be seen. The vegetal matter passed without digestion but it was in pieces 2"—4" appeared to have been cut by teeth.

This particular dog looked quite weak and appeared to be quite junior in pack hierarchy as was apparent from its behaviour with other members of the pack. While the pack was resting, this fellow was sitting quite far (about 25 yards) from other dogs of the pack. After a rest of about 15 minutes when other dogs started approaching the weak dog, then this fellow moved off in advance towards the forest. It is likely that, because of poor health condition, the dog has chewed some grass and eaten some soil. The point of interest is that the dog has saten only *B. odorata* which is common in the area, but still there are more common grass species having better chances of physical encounter. This suggests that the dog was choosy in eating *B. odorata*.

Management Problems of Wildlife in Tropics

By

DR. D.K. BELSANE, PH.D., D.Sc.

(Contd. from Cheetal—Vol. 24, No. 4, Page 42)

1) **The Gaur:**

The Gaur is the large ox of mainland of Asia. Once common in the tropical forests of South East Asia, it is now found only in scattered herds in India, Burma, Thailand and possibly Cambodia and in remote mountains of Laos and South and North Vietnam.

2) **The Kouprey:**

The Kouprey numbered perhaps 560 in 1964 and the estimates in 1970 was 30 and 70. Like other wild cattle, Kouprey is a tempting target for hunters, both for food and sport. Its horns have been a much prized trophy amongst the hunters outside Cambodia.

The Kouprey resembles gaur in its marked dorsal ridge, the dark colour, the dewlap and the absence of a light rump, patel. It resembles banteng in its short glossy hair coat, chestnut coloured eyes, in the shape of head and in the position of its horns. It differs from banteng, gaur and gayal in basic skull characteristics, greater total tail length, conspicuous notched nostril, narrow ears and more graceful built.

3) **The Wild Asiatic Buffalo:**

The wild Asiatic buffalo is associated with grass jungles and marshes along large rivers and their tributaries, and close to the coast. It was once common from Nepal to Indo China and Malaysia, but it is now very scarce in this range. There are 2000 animals in India and Nepal, and fewer still in other countries. It has been forced to retreat from human activities such as rice farming and domestic cattle ranching. Though it tends to live in natural reservoirs where it still occurs, unfortunately most of the habitat suitable for the buffalo had vanished by the time these reserves were created.

Management Problems of Sea Turtles in Tropics

The Sea turtles in tropics are being over-exploited for feed, clothes and adorn the wealthy Europe, North America and Eastern Asia. Their population is being lost through land development that destroys nesting beaches, through reef destruction, through the accidental drowning of turtles in trawl nets, and through failure of States to join together to

protect species that migrate from areas under one coastal jurisdiction to other. The turtle species in tropical coasts that need special attention to conserve are: *Lepidochelys kempfi*; *L. olivacea*, *Eretmocyelys imbricata*, *Chelonia mydas*; *Caretta caretta* and *Dermochelys coriasea*.

There are eight factors that determine the fate of sea turtles in modern world. These are:

- i) The use of sea turtles as food.
- ii) The use of sea turtle products in local commerce.
- iii) The international trade in sea turtle products.
- iv) The differing attitudes towards conservation in different countries.
- v) The incidental destruction of sea turtles that occurs during the fishing of other species.
- vi) The effects of nesting back alteration our destruction
- vii) The effects of marine and land-based pollution
- viii) The natural recovery rates of the various sea turtle population under different conditions of exploitation and incidental stress.

3) Management Method

a) *Protection of eggs* from heavy predation, heavy human exploitation and physical damage to nesting beach. The eggs can be removed to the sites or specially prepared hatcheries.

b) *Protection of hatchlings*: This can be done by limiting beach traffic and disturbance at vulnerable pre-emergence and emergence stages at *in situ* nests. The hatchlings should be immediately released by the eggs and hatched in hatcheries. They can be retained for headstailing. Similarly they should be removed to safe habitat.

c) *The adults and sub-adults*: They can be managed by protecting their habitat which includes the creation of protected areas such as national parks of reserves, management efforts, or simple limitation of access or activities in specific areas of specific terms.

4) Policy to check over-exploitation:

a) *Economic*: Leather trade of sea turtle especially those of *Lepidochelys olivacea* and *Chelonia mydas* should be terminated. Similarly the trade in tortoise shell, which has a cultural value (marriage etc.) should be replaced by developing synthetic substances. The eggs should be collected from distant sites and be taken special care of the trade in shuffled juvenile sea turtles (exa. *Eretmochelys imbricata*) should be banned, as it is a luxury trade.

b) *Non-commercial hunting*: The hunting of turtles by aborigines for food can be allowed if it has minimum impact on turtle populations.

c) *Farming*: The commercial mariculture of turtle population must be in conformity with all applicable conservational regulations and laws whether local, national, regional or international. The farm products should not be misused by importers or exporters of wild turtle products. The establishment of new commercial turtle farms must be discouraged if it is causing pressure on turtle populations.

d) *Control of incidental catch*: The incidental catch is a major threat to many sea turtle populations and this should be reduced to very low levels. All tropical countries should establish restricted fishing zones in areas of high turtle concentrations. Information on the magnitude of incidental catch of sea turtles is needed. The turtles which remain alive in catch should be released in water.

e) *Ecological research*: The research programme on ecology of sea turtles with special reference to their biology and populations assessment is needed.

f) *Conservation education*: Conservation education in different countries should be enhanced through various agencies to the coastal people.

g) *Legislation*: Both national and international one should be made.

h) *Co-operative efforts*: There should be exchange of information and the development of joint conservation programme among the developing countries in tropics.

References

- Bassus, W. Wildlife conservation and wildlife management in tropical regions. In UNEP-course on Ecosystem Management. Dresden, GDR. Vol VII, 1976, pp 25-63.
- Desmann, R.F. Wildlife Biology, New York—London—Sydney. 1964, pp 231.
- Hasan, S.M. Evaluation of pinch period in Kanha National Park. 1973, pp 1-160.
- King, R.T. Wildlife and Man. N.Y. 1966. State Conserv. pp 20: 8-11.
- Koppikar, B.R. Water as limiting factor in Melghat Tiger Reserve. The Indian Forester (Special Issue). 1979. pp 37-51.
- Nair, P.V. & M. Gadgil. The status and distributions of elephant populations of Karnataka. J. Bombay Nat. Hist. Soc. 75 [suppl] (1980) 989-999.

Wildlife Conservation and Land-Use Planning

By

VINOD RISHI*

National economy, social benefits and the development of any society are intimately linked up with the nature of resources and the patterns of use at its disposal. For most of the under-developed and developing nations agriculture, forestry, pasturing and mining are some of the basic resource-use activities. With the economic development of the society the patterns of resource use undergo rapid changes till they more or less stabilise when the nation has reached a reasonably sound level of economic development. During the initial phase of development there is always a tendency to over-exploit the indigenous landed resources. In agriculture society the expansion of agriculture is taken up first and more and more fertile areas are brought under the plough. It is followed by the development of trade, industry, technology and natural resources. Land is the common currency that is consumed up by each of these sectors of development. Soon, a stage is reached where the developing nations find themselves presented with problems of unusual complexities in planning the allocation of land to meet the pressing needs of increasing populations and developmental activities. At this stage they find it impossible to reverse the decisions on the allocation of land made by them for various purposes in the past and make suitable land available to meet the required need.

The emergence of wildlife as an ecologically important natural resource has introduced a trend of declaring more and more areas as protected for the conservation of this important asset, irrespective of their sizes, security indices, human pressures and stresses generated by the presence of other developmental activities involving settlement of labour and staff colonies, land inundation, resettlement of people, introduction of wildlife barriers etc. This development, though much needed and welcome for the sake of preserving the integrity of a nation's ecosystems, is restricted by some inherent limitations such as the extent of land available for the purpose. Let us, for instance, take the case of our own country. The total land surface available for use is of the order of 3.28 million square kilometres. This much of land is to support a variety of land-use patterns including agriculture, forestry, industry, urbanisation, conservation etc., but the demand for each of the sectors does not remain constant. For this reason patterns of use of any piece of land is subjected to undergo changes. Towns have come up where agricultural crops used to grow; roads have crisscrossed the countryside; forest lands have become lakes and croplands, and so on. Between 1957-58

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and 1973-74 the number of livestock grazing in the forests increased by 32.62%. During the last three decades, more than 41,000 square kilometers of forest lands were diverted for uses other than forestry. Out of this more than 4,790 square kilometers of land was lost to river-valley projects, more than 25,000 square kilometres to expansion of agriculture, more than 1,2000 square kilometres to the development of industries and the the rest to roads, other means of communication and other miscellaneous uses.* The requirement of fuelwood in India in 1975 was of the order of 130,000,000 tons while the production was only 20,000,000 tons. According to the figures projected by the National Commission of Agriculture, India will be needing, by the end of this country, about 200,000,000 tons of fuelwood. The total growing stock in the forests in India is 1,735 million cubic meters from which gross annual increment is only 33.27 million cubic metres, or about 29.5 million tons.

Land is a dear commodity. It is time to concentrate on identification of best uses a particular chunk of land may be put to and select the use-pattern that would offer the maximum returns which may not necessarily be in monetary terms. The practice of using the land as and where conveniently located is to be re-examined in the context of the ethics of conservation as laid down by the World Conservation Strategy. The ever increasing demands for meeting the needs of any dynamic society engaged in developmental procedures rule out the scope for making personal guesses regarding the policy to be adopted for management of the areas and the resources they offer. Conservation is a social process and is 'the management of biosphere reserves for use by human kind so that the biosphere may yield the greatest sustainable benefit to the present generation while maintaining its potential to meet the needs and aspirations of future generations.' (IUCN—World Conservation Strategy). Thus, it is not averse to the idea of utilisation of any resource and, consequently, not alienated from the needs of development. But it calls for classification of available land on the basis of its capability to produce resources and fixation of priorities of use for each capability class.

The work on land-use capability classification in India in past did not recognise wildlife as a major type of land-use. Eight land capability classes have been recognised on the basis of suitability for agricultural purposes. Based on the intensity of hazards and limitations in use the land capability classes are arranged in a systematic order in accordance with the properties that determine the ability to produce agricultural crops on a sustained basis. The factors that determine land capability include major soil characteristics such as the soil depth, soil texture, pH value and the associated land features such as the slope, extent of erosion, type of erosion etc. However, all the eight classes occur in wildlife habitats and it is impossible to say which one is the best suited and which one is the worst for wildlife conservation for the simple reason that the term wildlife is not restricted in its application to the four-

footed wild animals only. It makes the task of fitting wildlife conservation as a land-use pattern into the existing land-capability classification, difficult and demanding.

Existing Land Capability Classes

Type Sl. No.	Limitations	Land use for which it is suitable	Remarks
I	very few	a, f, p, w	Well drained, level no erosion or floods deep workable soil good water regime.
II	only certain types of crops can be culti- vated.	a, f, p, w	Need simple soil conservation practices, need one or more treatments to maint- tain viability.
III	for restricted use as a cropland, many limita- tions.	a, f, p, w	Need soil and water conservation practices; low fertility.
IV	Severe limitations shal- low soils, steep slopes, etc.;	f, p, w	Need careful handling if used as crop- land; pasturing to be controlled.
V	no erosion hazards, not suitable for cultivation, severe climate, stony, level.	f, p, w	Crops do not grow because of very few but incurable limitations.
VI	Steep slopes, severe erosion hazards, stony, not suitable for agricul- ture.	f, p, w	Salinity, low moisture retention, and other incurable limitations combined with erosion hazards.
VII	low productivity, enti- rely unsuitable for cultivation, pasturing can harm the land.	f, w	Suitable only for non-consumptive use.
VII	totally unsuitable for agriculture, forestry, pasture.	w	'Bad lands'; marshes, crags, deserts etc.
Key for reference: a; Agriculture p: Pasture		f: Forestry w: Wildlife	

These classes do not indicate the ecological integrity status of the area nor do they indicate the shape and compactness which are extremely important for the purpose of wildlife management. The limitations for development of a wildlife land-use classification system also include the lack of public involvement in the activity of wildlife management on private lands. However, the following points may be examined when fixing priority of wildlife over other land-use patterns as and when such a classification is attempted:—

1. The priorities may be fixed on the basis of:
 - a. Existing land capability classes,
 - b. Economic considerations,
 - c. National policy on wildlife conservations,
 - d. Social needs of the people residing in the neighbourhood, and
 - e. Scientific analysis of requirements for planned wildlife management.
2. Wildlife may be an appropriate form of land-use where:
 - a. The species that occur and the associations that exist in the area are endemic to the area,
 - b. The species found in the area are rare or threatened,
 - c. The past forms of land-use practices have destroyed the physical base on which they rested and the land is being left unused,
 - d. Wildlife is a commercially viable proposal,
 - e. There is no better land-use practice available due to the inherent limitations of the area,
 - f. Wildlife is recognised for its value for social, religious or ecological reasons, or
 - g. Where preservation of this natural heritage is more important than any other kind of land-use pattern.

Priority fixation involves taking of bold decisions where a choice is to be made between the economic returns from land through other types of land usage and conservation of the heritage. As a land-use, wildlife may be managed as a long-term activity, as is the case with protected areas, or a short-term activity, as would be the case with game farming and ranching. It can also be a part of multiple use pattern. Conflicts with agricultural sector can be

reduced if wildlife management is recognised by people as a possible farmland activity. Utilisation, if handled with restraint, can become a valuable tool for wildlife conservation.

However, land capability classification cannot and should not be treated as an end in itself. We have limited expanse of land at our disposal. Wildlife conservation can be successful only if it is practised by the people themselves. The current experiment of extending forestry practices to people through the social forestry programmes can provide valuable guidance for extension of wildlife conservation programme to wildlife habitats outside the government owned lands. The land-capability classification for wildlife conservation should act as a guide for taking decisions on the question of whether or not to convert the area use pattern from one type to another. A cost benefit analysis may be called for before taking such a decision for the ecological impacts may outweigh financial liabilities. Just as the changing social and natural environment has placed a variety of demands on the forestry sector wildlife conservation is also bound to undergo similar stresses. The concept of multiple land-use and integrated development plans will have to replace the current trend of managing land for a single activity-sector and it is here that land-use planning has a great role to play for the conservation of our wildlife resources.

References

1. Anon. (1961). Soil Survey Manual, I.A.R.I.
2. -do- (1961). 100 years of Indian Forestry, Forest Research Institute, Dehra Dun.
3. -do- (1981). Progress of Forestry in India, Ministry of Agriculture, Delhi.

New Record of Hedgehog from Madhya Pradesh

By

N.K. SINHA AND P. RAY

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While studying the ecology of artiodactyles in central India one of the author (N.K.S.) has frequently seen the hedgehog in Kanha National Park, Mandla and Balaghat districts, Madhya Pradesh (Lat. between 22° 08' and 22° 24' N. and Long. 80° 32' and 80° 45' E.) between 1970 and 1982. This was more frequently seen during the rainy season (June to September) when the holes, where it lives are normally filled with rain water. Being a nocturnal animal it is more active at dusk and used to come out and settle on the forest roads which are comparatively dry with less vegetation. On being approached it swiftly runs away. This makes the identification upto species level difficult by sight observation especially at dusk. As the locality of its inhabitation falls under the jurisdiction of Kanha National Park where shooting or trapping of animals is strictly prohibited, the specimen of hedgehog could also not be collected.

Ellerman and Morrison-Scott (1951) have given the detailed distribution of different species of hedgehog in India. According to them there are two species of hedgehog occur in India. They are *Hemiechinus auritus collaris* (Gray, 1830) having distribution in "between the river Jamuna and Ganges, India," and *Paraechinus* (?) *micropus nudiventris* (Horsfield, 1851) having distribution in "Madras, South India". Ellerman and Morrison-Scott (op.cit) have also mentioned two more species of hedgehog. *Paraechinus micropus micropus* (Blyth, 1846) and *Paraechinus hypomelas blanfordi* (Anderson, 1878) but the distribution given for them were now not India and is part of Pakistan. According to Prater (1971) there are two species occurring in India belonging to two different genera. These are *Hemiechinus auritus collaris* (Gray) commonly called as longeared hedgehog. It has deep brown, almost black fur on its body and under parts and no parting of base of spine. It inhabit dry desert zone of Cutch, Sind, the Punjab and the former N.W.F.P. and the neighbouring tract. The other is pale hedgehog *Paraechinus micropus nudiventris* (Horsefield). It is lighter in colour. It has a parting base of spines running from the centre of the fore head to the crown. The pale hedgehog is confined to the plains of south India.

Hedgehog are nocturnal animals and come out to feed at dusk and retires at dawn. They mostly inhabit dry places and desert. They live in holes baneath bushes or tufts of

grasses. They are omnivorous and eat slugs, lizards, rats, mice, eggs, fruits and roots. According to Prater (1971) hedgehog cover long distances in their rambles going at a steady trot.

The occurrence of hedgehog in the Kanha National Park, extends the range to central India in the Indian peninsula. The Kanha National Park is situated in the valley between Maikal range, a branch of Satpura and Vindhyan range.

The hedgehog could have a much wider distribution than so far attributed to it and is evident by its occurrence in the Indian peninsula. Further thorough surveys might extend its range still further. This record is the first from Indian peninsula and it is likely that the hedgehog might also exist in some more pockets in central India although Prater (1971) has not recorded it. Due to absence of shooting/trapping licence the species of hedgehog could not be identified. Efforts should be made to obtain the shooting/trapping licence in the Kanha National Park for establishing the species of hedgehog occurring there.

References

- Ellerman, J.R. and Morrison-Scott, T.C.S. (1951). *Checklist of Palaearctic and Indian mammals* (1st Ed.) London.
- Prater, S.H. (1971). *The book of Indian animals* (3rd. Ed.) Bombay.

The Nanda Devi National Park: A Suggestion For

By

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The existing literature on the subject reveals that the Nanda Devi area has been of great interest and importance due to its uniqueness well before the time when it was first stepped in by two well known extraordinary travellers of the unexplored world. Eric Shipton and Bill Tilman^{12, 13}, in 1934. They also called the Nanda Devi Sanctuary as 'Valley of The Lost Horizon'³. After they pioneered the approach route to the area through Rishi Gorge⁸, which is now known as one of the world's fascinating trek, the area attracted a large number of mountaineers from all over the world as it abounds several high peaks such as: Dunagiri (7066 m), Changabang (6864 m), Kalanka (6931 m), Nanda Devi East (7434 m), Nanda Khat (6631 m), Devsthan (6678 m), Maiktoli (6633 m), Mrigthuni (6855 m), Trisul (7120 m), Bethartoli (6352 m) and Nanda Devi West (7817 m or 25,645')—the highest peak of the Garhwal Region). Simultaneously, during the last two decades or so, the area has received much attention from various naturalists^{2, 6, 10}, wildlifers¹, ornithologists^{5, 9}, botanists¹¹ and researchers⁴ etc.

On the basis of recommendations made by these foregoing explorers, naturalists and scientists the Government has recently declared the area as a National Park (Nanda Devi National Park) on 6th November, 1982. Which means a very good check on rapidly deteriorating condition of the area. Further, it is learnt that the area is still being paid more attention by the Government of India as it is one of the twelve 'Proposed Biosphere Reserves' in the country⁷.

Although much has already been done to protect, preserve and conserve the fauna and flora of the park but there is still a small lacuna left. Which the present authors realised during the course of their four visits (1981-83) to the base camps of Nanda Devi (4300 m), Dunagiri (4750 m), Changabang (4800 m), Kalank (4900 m) and Trisul (4200 m) peaks, which fall within the park area, in connection with a Man and Biosphere (MAB) research project on "Status survey of endangered and threatened species of mammals and birds at Nanda Devi National Park". The lacuna is that during the past a very large amount of unnatural man-made goods, viz., Mountaineering equipments, Food (mostly tinned), Medicines, Polythene Wares (including packing materials) etc. had have been carried into the park area by several expedition parties and an unaccounted (numerically speaking) number of porters who accompanied them. A considerable amount of these used and unused, some unwanted and damaged but undestroyed goods e.g. Empty cans, Gas cylinders (most bearing foreign

trade marks), Medicines (especially tablets, capsules, syringes, also Carbon tetra Chlorate CCl_4 bottles), and polythene and tin wares, are still lying at and around all camp sites of the park area in general and base camps. This all has turned the latter in very bad shape e.g. Dunagiri Base Camp.

It is precisely with this point in view that the present article/note is written to call attention of the authorities concerned and it is being suggested that all the leftover unnatural substances should be either buried in deep ditches or be brought out of the park area and disposed off because it is feared that this may act as a hazard for fauna and floral populations of the area.

References

1. Dang, H. 1964a. The Himalayan Wildlife research project report. *CHEETAL, J. Wildlife, Preserv. Soc. India*, Dehra Dun. 7(1): 24-29.
2. Dang, H. 1964b. A natural sanctuary in the Himalaya: Nanda Devi and the Rishiganga Basin. *CHEETAL, J. Wildl. Presv. Soc. India*, Dehra Dun. 7 (1): 34-42.
3. Editorial, 1982. The Sacred Sanctuary. *Indian Mountaineer: A half-yearly National Adventure Journal*, IMF, New Delhi. Special Nanda Devi Number Spring 1982 No. 9. pp. 6-8.
4. Kandari, O.P. 1982. Nanda Devi—India's Highest Himalayan National Park. *CHEETAL, J. Wildl. Presv. Soc. India*, Dehra Dun. 24(1&2): 29-36.
5. Lavakumar, K.S. 1956. A contribution to the ornithology of Garhwal. *J. Bombay nat. Hist. Soc.*, Bombay 53 (3):315-29.
6. Lavakumar, K.S. 1978. Nanda Devi Sanctuary. (1977). *J. Bombay nat. Hist. Soc. Bombay*, 75(3): 868-87.
7. MAB-National Committee. Aug., 1979. Preliminary inventor on potential areas for biosphere reserve. MAB-National Committee, Government of India, D.S.T., New Delhi (The Nanda Devi Sanctuary, pp. 13-17).
8. Nanda Devi Expedition. 1981. Nanda Devi West Peak (7817 m or 25,645'), pp. 28-30. Sponsored by the IMF, New Delhi and financed by the Sanjay Gandhi Memorial Trust. Pp. 1-40.
9. Reed, T.M. 1979. A contribution to the ornithology of the Rishiganga valley and the Nanda Devi Sanctuary. *J. Bombay nat. Hist. Soc.*, Bombay. 76 (2): 275-82.
10. Sah, A. 1976. Nanda Devi Sanctuary. *CHEETAL, J. Wildl. Presv. Soc. India*, Dehra Dun. 18(1&2): 7-10.
11. Shah, N.C. 1974. A botanical survey in the Nanda Devi Sanctuary. Pp. 210-14. (Source Missing).
12. Shipton, E. 1936. Nanda Devi. London. Hodder and Stoughton.
13. Tilman, H. 1935. Nanda Devi and the sources of the Ganges. *Himalayan Journal*. 7:1-25.

Elephant census—TAMILNADU 1983

Date : 30.4.1983

Sl. No.	Name of the Division	Number of Elephants			TOTAL
		Bulls	Juveniles		
			Cows below 5' height		
I. Salem Circle					
1.	Hosur	15	86	43	144
2.	Dharmapuri	12	50	23	85
		27	136	66	229
II. Coimbatore Circle					
1.	Erode	16	130	53	199
2.	Satyamangalam	61	137	53	251
3.	Coimbatore	40	76	26	142
4.	Anamallais Wildlife Sanctuary	86	203	67	356
5.	Nilgiris North	42	143	55	240
6.	Nilgiris South	1	3	2	6
7.	Gudalur	28	39	18	85
8.	Mudumalai Wildlife Sanctuary	94	222	85	401
		368	953	359	1680
III. Madurai Circle					
1.	Dindigul	8	12	5	25
2.	Kodaikanal	0	10	5	15
3.	Theni	6	24	14	44
4.	Madurai	1	31	8	40
5.	Ramanathapuram	4	28	9	41
		19	105	41	165
IV. Tirunelveli Circle					
1.	Tirunelveli	1	3	1	5
2.	Kanyakumari	17	22	9	48
3.	Kalakkad Wildlife Sanctuary	3	3	2	8
4.	Mundanthurai Wildlife Sanctuary	12	21	11	44
		33	49	23	105
Total		447	1243	489	2179

Gaur Census—1983

Date : 30.4.1983

Name of the Division	Adults	Juveniles	Total
I. Salem Circle			
1. Hosur	12	1	13
2. Dharmapuri	—	—	—
3. Salem	52	24	76
	64	25	89
II. Coimbatore Circle			
1. Erode	98	4	102
2. Satyamangalam	154	27	181
3. Coimbatore	96	32	128
4. Anamallais Wildlife Sanctuary	310	83	393
5. Nilgiris North	119	27	146
6. Nilgiris South	—	—	—
7. Gudalur	14	1	15
8. Mudumalai Wildlife Sanctuary	163	48	211
	954	222	1176
III. Madurai Circle			
1. Dindigul	59	13	72
2. Kodaikanal	259	54	313
3. Theni	178	78	256
4. Madurai	245	61	306
5. Ramanathapuram	6	1	7
	747	207	954
IV. Tirunelveli Circle			
1. Tirunelveli	—	—	—
2. Kanyakumari	—	—	—
3. Kalakkad	9	4	13
4. Mundanthurai Wildlife Sanctuary	9	3	12
	18	7	25
Total	1783	461	2244

Popular Outcry to Save The Doon Valley

By

MRS. MADY MARTYN

For the past two decades the Doon valley has been outrageously devastated at an ever accelerating pace. This valley which is an unusual and environmentally fragile area used to be famous for its mountains, forests and streams, teeming with wild life.

After Independence the acquisition of private forest land increased the already large area of reserved forest held by the Government. This was looked upon as a useful supply of land to deforest and settle all manner of people, from Punjabi and Tibetan refugees to Tehri Dam oustees—every time land was wanted another forest block was denuded. Needless to say these settlers have made further inroads into the remaining forest for fuel and fodder.

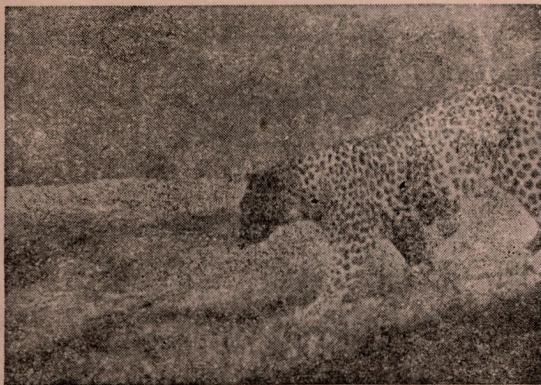
Next came limestone mining which has been carried out in a rapacious and unscientific manner, disregarding all mining safety regulations and environmental considerations. As a result landslides have buried whole villages, the cattle wealth and average milk yield has declined sharply, summer temperatures both in Dehra Dun and Mussoorie have risen steadily every year for the last two decades.

The worst aspect of the destruction of forests and the removals of the water-holding limestone has been the marked decline in the water discharge. The Doon Valley has no snow fed rivers and no natural subsoil water table. Tubewells if successful at all, are of uncertain yield and cost from twenty to one hundred times as much as the same tubewell in the plains.

The powers that be seemed deaf to hundreds of newspaper articles and petitions. At last this year the people of the Doon Valley have roused themselves to positive action. Villagers from all over the valley have petitioned the Supreme Court through the agency of the Rural Litigation and Entitlement Kendra, to put a stop to limestone mining and tree felling. The citizens of the town have also joined in by forming environmental societies, the "Save Mussoorie Society" and in Dehra Dun "The Friends of the Doon".

The Prime Minister was able to survey the devastation of the Mussorie Hills from a helicopter two years ago and convened a Doon Valley Board. The recommendations of that body made two years ago are parallel to the demands made by the environmental societies. But no action has been taken. In fact the U.P. Government is still going ahead with acquiring land for polluting industries based on limestone while another department of the same Government had cancelled the limestone leases for the raw material to feed these same industries.

The Friends of the Doon, who had already approached both the State and Central Governments, are again petitioning the Department of the Environment to reconstitute the Doon Valley Board with the involvement of the local administration and local organisations; and to speedily implement the decision already taken by this board.



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- (a) To promote interest in and impart knowledge regarding the preservation and conservation of all forms of wildlife, particularly among the youth of the country.
- (b) To co-operate with the Govts. of India and States and with other Societies and Institutions having similar aims and objects in working for the interests of wildlife.
- (c) To assist in enforcing and actively supporting the Forest Acts, Wild Birds and Animals Protection Acts and Rules etc. of States and the Indian Arms Act and Rules in so far as they pertain to wildlife and to bring to the notice of the authorities any infringement of the same and to assist in the detection and prosecution of offenders in respect of such laws.
- (d) To advise and help the Govt. and wildlife administrators in the formation, maintenance and protection of Sanctuaries and National Parks, the preservation of wildlife in general and rare species of India in particular and in the introduction of exotic species into the country, the rehabilitation of rare species etc. and in the revision on rational lines of the shooting and fishing rules, so as to conserve and increase wildlife stocks.
- (e) To raise funds for the carrying out of the above aims and objects and to found and maintain museums, reading rooms and libraries of natural history in order to disseminate knowledge regarding wildlife.
- (f) To promote sportsmanship in shikar and to recognise well regulated shooting and fishing, as a means of preserving wildlife and fish so that through wise use the surplus may provide a recreational asset to the nation.
- (g) To carry out publicity and propaganda for the preservation of wildlife in India by means of monographs, journals, films, film strips and other feasible methods.
- (h) To assist members of the Society in obtaining shooting and fishing facilities and facilities for viewing and photographing wildlife in India.
- (i) To conduct research into the problem of Wildlife management in India, and in pursuance of this, to initiate, encourage and, where possible assist in projects for the study of threatened species and related subjects and to provide reference and research facilities for such work.
- (j) To carry on such other activities which will serve the above subjects.

What membership of Wildlife Preservation Society of India will entitle you to ?

1. You will become an active member of the growing group of Wildlife enthusiasts, who enjoy working for and spreading the knowledge of how to conserve India's heritage of Wildlife for posterity.
2. You will be entitled to the full use of the library of the Wildlife Preservation Society and of its reading room.
3. You will receive a membership certificate.
4. You will receive personal Identification and Membership card.
5. You will be entitled to buy all publications of the Society at a concessional rate.
6. You will be entitled to buy at concessional rates the Society's Tic, and the Balance of Nature Game (specially published in colour for its educative and recreational value).
7. You will be supplied "Cheetal", journal of the Society free.

For membership particulars write to Honorary Secretary, Wildlife Preservation Society of India, 7 Astley Hall, Dehra Dun.